

Hands-On

Central Office POTS/DSL/Span Frame Wiring



Course Description

Distribution frames within a typical Central Office are simple in principle, but the multitude of frame types, block designs, and different switching hardware can create real challenges to the technicians who are responsible for fulfilling orders. Telco-dependent order processing systems also present a learning curve. Errors and misinterpretation can lead to systemic issues that can be both time consuming and costly to correct, and cause confusion until they are corrected.



The Central Office POTS/DSL/Span Frame Wiring Course has been designed to help telco techs with relatively little experience to understand how to wire different frame types and different cross-connect circuits correctly, the first time.

Various circuit types include POTS, xDSL, tie-circuits, alarms, and any other type of blocks in use by the telco. Vertical (cable pair) and horizontal (OE/line equipment) sides are shown, with multiple exercises for block and circuit locating. Different frame types (COSMIC, MDF/CDF, Protector, ICDF, Fiber) and the connection types (punch-down, solder, fiber) are explained. A brief overview on central office equipment is also provided, to help students understand all the parts of the telephone network (i.e. what is a DACS, switch, add/drop multiplexer, channel bank, loop extender, cable vault, etc.)

Digital Cross-Connect (DSX) circuit wiring is also discussed, with exercises on IN, OUT, and MON, DS1, DS3, span patching, plus the different types of DSX panels available, and common plug types (Bantam 309, 310). Tip, ring, T1R1, and E&M are explained, along with the standard telco wiring color code. Fiber optic types, safety, and good practices are also discussed.

The Frame Order Management System (FOMS) and Work & Force Administration Dispatch In (WFADI) are also demonstrated, with multiple exercises to help build familiarity and confidence.

Target Audience

The course is intended Central Office Technicians, Installation & Repair personnel, Electricians, Transport/Carrier personnel, and others who may be responsible for CO frame wiring.

Prerequisites

There is no prerequisite for this course, although some general background in Central Office equipment or telco practices may be helpful.

Course Outline

Module 1: Frames & The Subscriber Loop

- The Central Office
- Main Distribution Frame (MDF) vs. Central Distribution Frame (CDF)
- Common System Main Interconnecting Frame (COSMIC)
- Interconnect Distribution Frame (ICDF)
- Fiber Distribution Frame (FDF)
- Components of a Frame:
 - Vertical / Cable Pair
 - Horizontal / Line Equipment LEN/OE
 - Block Types
 - Protection Coil/Module Types, Testing
- Circuit Types:
 - POTS
 - DSL
 - Misc. (alarms, tie, NOC, etc.)
- Subscriber Loop
 - TR, T1R1, EM, SG/SB, Inside/Outside
 - Lines vs. Trunks
 - Loops, open, closed, AWG
 - Resistance, Inductance, Capacitance
 - Frequency Response, 3KHz VF, C-weighting
 - Loop Extenders, VFRs
 - Stubs, Opens, Shorts, Splices, Reflections
 - Coils/Protectors
 - DSL - data over a loop
- Examples
- Practice:
 - Finding Cable Pairs
 - Finding LEN/OE
 - Lead Types
- Terminology (cut sheet, shoe, short/open, tone-out, ANI, butt-in, etc.)

Module 2: Digital Cross Connects

- DSX Panels
 - Panel Types, plug-off, wire-wrap
 - IN, OUT, MON, Tx, Rx, Tip, Ring, T1, R1
 - T1/T3 Protection Modules
 - Wiring a Panel

- Looping a Span
- Patching a Span
- Test Sets - HP 4934/4935, T-Bird, Sunrise SW1000, Fluke 635, Sage 930, etc.
- Examples
- Practice:
 - Finding Spans
 - Plug-off vs. Loop vs. Patching
 - Dirty plugs, jacks, bad cable

Module 3: Fiber Optic Connects

- Fiber Safety & Good Practices
 - Class I thru IV LASERs
 - Jacket, cladding, fiber, cable dressing, fiber vs. copper
- Fiber Optics
 - Frames
 - Multimode, Singlemode, Filters, Splitters
 - Common frequencies (1310nm, 1490nm, etc.)
 - Connector Types: LC, FC, SC, MTP, etc.
 - Transceivers: SFP, QFP, XENPAK, etc.
 - Power Measurements
- Failure Modes
 - Insertion Loss
 - Bends, Removal/Insertion
 - UPC vs. APC polish, reflections
 - Degrading LASER (i.e. -1dB)

Module 4: Order Management

- Parts of an Order:
 - Circuit ID breakdown
 - In vs. Out, East vs. West
 - Cable Pair, LEN/OE
 - Bay Location
 - Order Type: In, Out, Change, Left-In
- Frame Order Management System (FOMS)
 - System Overview
 - Reading FOMS screens
 - Fault Codes, Jeopardy (Jep) Codes
- Work & Force Administration - Dispatch In (WFADI)
 - System Overview
 - Reading WFA screens
 - Examples
- Practice
 - Run an In Order
 - Run an Out Order
 - Troubleshoot a Circuit

Notes

This course is highly customizable, and can focus on any other particular areas desired, or be coordinated with an Overview or Maintenance course for a customized curriculum.

Delivery Method

Instructor-Led with numerous exercises and examples throughout.

Equipment Requirements

(This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

Course Length

3 Days